

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
A National Broadband Plan for Our)	GN Docket Nos. 09-47, 09-51, 09-137
Future, Data Sought on Uses of Spectrum)	
)	

Comments of Harris Corporation

NBP Public Notice #26

December 22, 2009

EXECUTIVE SUMMARY

Although Harris is supportive of the FCC's review of all spectrum allocations, current spectrum allocated to broadcasters is vital to the public interest and should not be reduced or reallocated. Broadcasters should be viewed as an asset, not an obstacle to advancing the Commission's broadband goals. Broadcasters have unique non-economic values that makes broadcasting a valuable medium and worthy of its current spectrum allocations.

Utilizing broadcasters' current spectrum allocations, broadcasters and manufacturers are working on a number of new applications that will advance the broadcast industry into the digital age and lay the groundwork for future innovation. However, with the digital transition taking place just over six months ago, broadcasters and manufacturers still need time to roll-out new digital applications. Repacking broadcast stations to recover spectrum would only inhibit current broadcast capabilities, prevent further technological innovation within the broadcast industry, and waste billions of dollars in investment. Current spectrum allocations are necessary for broadcasters to provide existing services and enable the type of enhanced broadcast services sought by consumers and the Commission. Nonetheless, dynamic channel sharing of TV white spaces would be permissible, especially in rural areas, on a non-interfering, licensed basis.

Dismantling broadcasters' capabilities and further reducing or eliminating broadcasters' current spectrum allocations would be adverse to the public interest. When developing the National Broadband Plan the Commission should seek to leverage broadcasters' abilities and infrastructure by making broadcasters part of the country's broadband solution.

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To: The Commission

**Comments of Harris Corporation
NBP Public Notice #26**

Harris Corporation (“Harris”) respectfully submits these comments in response to the Federal Communications Commission’s (“Commission”) Public Notice¹ seeking comment on the current use of spectrum licensed to broadcast television stations. Harris Corporation is an international communications and information technology company serving government and commercial markets in more than 150 countries. Harris Broadcast Communications, a division of Harris, is headquartered in Mason, Ohio, and operates the world’s largest transmitter factory in Quincy, Illinois. As the world’s leading broadcast transmission equipment supplier, Harris is the leader in digital solutions for television and radio broadcasting. Harris Broadcast Communications has been at the forefront of the transition to digital television, supplying the majority of the digital television transmitters and encoders in the United States. Harris is committed to facilitating technological advancement within the broadcast industry and focused on helping customers succeed as they transition to the world of digital media. Harris Broadcast

¹ See Data Sought On Uses of Spectrum, *National Broadband Plan Public Notice Number 26*, GN Docket Nos. 09-47, 09-51, 09-137 (rel. Dec. 2, 2009) (NBP Public Notice 26”) (requesting comment on the current and future uses of broadcast spectrum and the impact of repacking, reallocation, and channel sharing on the broadcast industry, public, and Commission’s broadband goals).

Communications is an active member of industry and standard setting organizations including the Advanced Television Systems Committee (“ATSC”) and National Association of Broadcasters (“NAB”).

I. Introduction.

Harris firmly believes that broadcast television is a vital part of America’s broadband solution. While Harris is supportive of the FCC’s review of all spectrum allocations, current broadcast spectrum allocations do not run counter to the Commission’s efforts to expand comprehensive broadband capabilities nationwide. Broadcasters should be viewed as an asset, not an obstacle to advancing the Commission broadband goals. Those advocating for the reallocation of broadcast spectrum based on economics overlook the non-economic factors that make broadcasting such a valuable medium. Harris agrees with the Association of Maximum Service Television (“MSTV”) and NAB that when evaluating the value of broadcast spectrum the Commission must “look beyond purely economic factors and instead put a premium on the public policy benefits of an existing spectrum use when determining the efficiency and value of that use.”²

Over-the-air broadcasting has unique infrastructure benefits that the Commission should be looking to leverage, not dismantle. Utilizing broadcasters’ current spectrum allocations, broadcasters and manufacturers are working on a number of new applications that will truly advance the broadcast industry into the digital age and lay the groundwork for future innovation. However, with the digital transition taking place just over six months ago, broadcasters and manufacturers still need time to roll-out new digital applications. Repacking broadcast stations to recover spectrum would inhibit current broadcast capabilities, prevent further technological

² Reply Comments of the Association for Maximum Service Television and National Association of Broadcasters, In the Matter of a National Broadband Plan For Our Future, Public Notice Number 6, GN Docket Nos. 09-47, 09-137, 09-51, p. 5 (filed Nov. 13, 2009) (NAB/MSTV Reply NBP PN #6).

innovation within the broadcast industry, and waste billions of dollars in investment.

Nonetheless, Harris would support dynamic channel sharing of broadcast spectrum that is not being fully utilized by broadcast licensees, especially in rural areas, on a non-interfering, licensed basis.

It should be noted by the Commission that broadcasters have made monumental strides in increasing broadcast spectrum efficiency over the past ten to fifteen years. While broadcasters will continue efforts to increase spectral efficiency, current spectrum allocations are necessary for broadcasters to provide existing services and enable the type of enhanced broadcast services sought by consumers and the Commission. When developing the National Broadband Plan the Commission should not act out of haste or based on mischaracterizations of broadcasters' utilization of existing spectrum allocations.

II. The Commission Should View Over-the-Air Broadcasting as an Asset to the Commission's Broadband Initiatives, Not an Obstacle.³

Access to broadband and broadcast is not a mutually exclusive proposition. Both broadband and broadcast can simultaneously prosper. In the National Broadband Plan the Commission should aim to leverage each services unique capabilities in order to enhance each mediums unique offerings. Choosing one service over the other “would not only be contrary to legislative intent, but it would be contrary to the public interest as well.”⁴ Broadcastings ability to serve one-to-many is unique across all communications services. The Commission should present Congress with a National Broadband Plan that takes advantage of the pervasiveness of broadcasting and encourages broadcasters to be a part of the broadband solution.

³ Question A.1 of the Commission's Public Notice asks: “what factors should the Commission consider when examining and comparing the benefits of spectrum used for over-the-air television broadcasting and those of spectrum used for wireless broadband services.” NBP Public Notice 26, *supra* note 1, at 1.

⁴ NAB/MSTV Reply NBP PN #6, *supra* note 2, at 3.

This past year both Congress and the Commission affirmed the societal importance of free, over-the-air broadcasting. For example, during the consideration of the DTV Delay Act,⁵ which moved the deadline for ceasing analog broadcasts from February 17 to June 12, 2009, Congress decided to delay the transition in order to ensure “as many as 21 million households...do not lose access to news, information and emergency alerts.”⁶ Following the digital transition, FCC Chairman Julius Genachowski noted that “[b]roadcast television remains an essential medium, uniquely accessible to all Americans.”⁷ Broadcasting provides the public with a hyper local, free, ubiquitous, point-to-many communications network that is distinct from any wireless broadband service. By failing to preserve broadcasters’ current spectrum allocations the Commission would be missing an opportunity to leverage broadcasters’ nationwide footprint in order to promote nationwide broadband deployment and adoption.

While on a day to day basis Americans may take the capabilities of broadcasting for granted, the power of broadcastings reliable, redundant, and resilient infrastructure is most apparent during emergencies. Hurricane Katrina served as a stark reminder of the fragility of America’s communications infrastructure. Many wireless and wired telecommunications networks were either significantly damaged or completely failed during the storm. Those networks that did stay up during the storm frequently became overloaded and failed to meet the needs of both the public and first responders. Hurricane Katrina exposed many of the shortcomings within the country’s telecommunications infrastructure. Although many broadcast stations suffered damage and failures during Hurricane Katrina, broadcasters’ ability to keep the

⁵ DTV Delay Act, Pub. L. 111-4, 123 Stat. 112 (Feb. 11, 2009).

⁶ Press Release, Senator Jay Rockefeller, Rockefeller Announces Compromise on DTV Delay Bill (Jan. 23, 2009), <http://rockefeller.senate.gov/press/record.cfm?id=307265>.

⁷ Statement of Julius Genachowski, Chairman, Federal Communications Commission, Before the United States Senate Committee on Commerce, Science and Transportation, Hearing on “Rethinking Children’s Television Act for a Digital Media Age” (July 22, 2009).

public informed during and after the storm demonstrated the resiliency and reliability of the broadcasting model. The very nature of broadcasting eliminates problems frequently faced by telecommunications providers, such as network “overloading” and “congestion.”

During Hurricane Katrina broadcast stations were able to pool resources and leverage their own infrastructure to keep the public informed.⁸ For example, Belo owned WWL-TV in New Orleans, Louisiana, was able to remain on the air both during and after Hurricane Katrina. In fact, WWL-TV’s signal was able to be carried statewide in Louisiana and Mississippi through a network of digital broadcasting channels, public television stations, and live video streaming on its Website.⁹ WWL-TV was able to leverage both broadcast and broadband infrastructure to keep the public informed. Likewise, while sustaining serious damage from Hurricane Katrina, WLOX in Biloxi, Mississippi, was able to remain on-air following the disaster on back-up power.¹⁰ As part of the National Broadband Plan the Commission should examine how to leverage, not dismantle, broadcastings’ expansive and resilient infrastructure to further the Commission’s broadband initiatives.

⁸ Comments of the National Association of Broadcasters, In the Matter of Recommendations of the Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, EB Docket No. 06-119, p. 7 (filed Aug. 7, 2009).

⁹ See *WWL Continues Coverage Despite Katrina’s Devastation*, Broadcast Engineering (Sept. 8, 2009) available at <http://broadcastengineering.com/newsrooms/Wwl-site-katrina-20050909/index.html>.

¹⁰ See *Stations Grapple with Aftermath of Katrina; NAB Solicits Help*, Broadcast Engineering (Sept. 2, 2005) available at <http://broadcastengineering.com/RF/WLOX-Biloxi-MS-Mississippi-20050902/index.html>.

III. Repacking Broadcast Stations Would Hinder Current Broadcast Capabilities and Inhibit Further Technological Innovation.¹¹

A single television broadcast channel consists of six megahertz (“MHz”), which supports a bit rate of 19.4 megabytes per second (“mbps”). While a single Standard Definition (“SD”) or in most cases High Definition (“HD”) stream does not require all six MHz of broadcasters’ spectrum, in order to provide the types of enhanced services envisioned by Congress and the Commission, all six MHz are necessary. On average, an HD channel stream uses between 10 mbps and 16 mbps; a SD channel stream uses between three mbps and six mbps; a mobile DTV stream uses 2.75 mbps, but can range from one mbps to 14 mbps depending upon the number of mobile streams being transmitted; and non real-time delivery applications, such as Sezmi, can range from 500 kbps to three mbps. While the flexibility of the ATSC family of standards allows a television broadcast station to deliver an individual HD stream, a combination of HD and SD/Mobile DTV streams, or a combination of SD and Mobile DTV streams, these combinations can quickly use up broadcasters’ current six MHz of spectrum.

Repacking broadcast stations would be a detriment to the public interest by hindering current broadcast capabilities, inhibiting innovation, and wasting the money invested by broadcasters, consumers, retailers, manufacturers, and the government in digital television technology. The full capabilities of digital broadcasting will never be realized if broadcasters’ spectrum allocations are diminished any further than was called for as part of the digital television transition. Broadcasters, manufacturers, retailers, and consumers have all relied on the Commission’s guidance and rules when investing in research and development, creating business

¹¹ Question A.3 of the Commission’s Public Notice asks: “what would be the impact to the U.S. economy and public welfare if the coverage of free over-the-air broadcast television was diminished to accommodate a repacking of stations to recover spectrum?” Question B.3 asks: “how will video capabilities improve over time using current MPEG-2 and 8-VSB technologies? What improvements could be gained by deployment of next generation technologies over that currently achieved under the ATSC standard? What would be required for broadcasters and consumers to transition to more advanced technologies?” NBP Public Notice 26, *supra* note 1, at 2-3.

plans, deploying new digital technology, selling products, and making purchases. After the country has invested so much time, effort, and money into making the dream of digital television a reality, and just as its benefits are coming to fruition, now is not the time for the Commission to reverse course.

IV. The Commission Must Provide Broadcasters With Sufficient Time to Develop and Deploy New Innovative Digital Applications.¹²

As a result of the digital television transition, not only was 108 MHz of prime “beachfront” spectrum reallocated by broadcasters to facilitate the expansion of new wireless services and public safety communications, but a new era of television broadcasting commenced. Utilizing just six MHz of spectrum per broadcast station, broadcasters have been able to expand their offerings to the public. Digital television provides broadcasters the ability to offer a number of new enhanced services including HD programming, multicasting, Mobile DTV, advanced public safety services, data casting, and other ancillary and supplemental services. While many of these enhanced services, such as HD programming and multicasting have been in the process of being rolled out for some time, many enhanced digital television services are still being developed or are on the cusp of deployment.

Short circuiting the deployment of new enhanced broadcast capabilities and further development of currently deployed services would be adverse to the public interest. As the leader in digital solutions for television and radio broadcasting, Harris is uniquely qualified to comment on the status of emerging digital broadcasting technologies. Currently, Harris is working with a number of partners in the broadcast industry and equipment manufacturer community on new innovative products utilizing broadcasters’ digital spectrum.

¹² Question A.5 of the Commission’s Public Notice asks: “how do broadcasters plan to use licensed spectrum in the future” and “what innovations in applications services or business models will create synergies between broadband and broadcast services, or other new value from currently licensed spectrum?” NBP Public Notice 26, *supra* note 1, at 2.

A. Mobile DTV Is On The Cusp Of Nationwide Deployment.

Consumers increasingly demand the content they want, delivered when they want it, on their favorite devices, in a location of their choosing. Mobile DTV provides broadcasters the opportunity to meet these consumer demands and expand the reach of the public benefits broadcasters provide. On October 15, 2009, the ATSC adopted the ‘A/153 ATSC Mobile DTV Standards (“Mobile DTV Standard”). The adoption of the Mobile DTV Standard will provide broadcasters and equipment manufacturers the opportunity to find new innovative ways to utilize broadcasters’ existing digital spectrum. In particular, the Mobile DTV standard will provide broadcasters the ability to offer a number of new services to mobile devices including free over-the-air television, interactive services delivered in real-time, subscription-based TV, and non real-time file based delivery of content for playback at a later time. With the adoption of the Mobile DTV Standard, the broadcast industry has reached a pivotal moment in the development of digital broadcast services. In fact, in 2010 broadcasters nationwide are poised to launch Mobile DTV services.

Over the past four years Harris has played a leadership role in the development and deployment of Mobile DTV.¹³ Harris has been involved in the development of Mobile DTV standards and technology including two years of work co-developing the physical layer of the standard with LG and Zenith, and two years working with the ATSC Technical Standards Group. Harris was a leading participant in the Open Mobile Video Coalition’s (“OMVC”) independent demonstration of viability testing of the Mobile DTV Standard and assisted consumer electronics manufacturers in their mobile receiver product development process by providing test streams and signal generation equipment. Currently, Harris is supporting the ATSC Mobile DTV

¹³ *Attachment A* provides a description of Mobile DTV solutions generally, as well as a summary of Harris specific Mobile DTV offerings.

“Model Station” program that put reference stations on the air in Seattle and Atlanta using the Harris® MPH™ platform.¹⁴ Harris is also supporting over-the-air transmission for the current check-out phase and will support the upcoming deployments, including the Washington D.C. OMVC Mobile DTV Consumer Showcase. Today, just two months after final adoption of the Mobile DTV Standard, approximately 30 television stations in the United States and Canada are on-the-air with commercial deployments of the of the Harris® MPH™ platform.

B. Broadcasters are Uniquely Positioned to Offer Mobile Video Services Utilizing Their Infrastructure.

The ability to deliver video to mobile devices is ultimately tied to a services infrastructure. Broadcasters’ infrastructure is particularly well suited to support mobile video service. The hallmark of the broadcast model is that it supports an unlimited number of viewers, typically within a large coverage area, from a single or small number of high power transmitter sites. As highlighted by NAB President and CEO, Senator Gordon Smith, broadcasters represent one of the most economically and spectrally efficiency users of spectrum:

Broadcasters generate tremendous efficiencies through their ability to serve “one-to-many” in small bandwidth segments—efficiencies that cannot otherwise be achieved. Indeed, with each additional viewer, a broadcaster’s use of spectrum becomes more efficient, because increasing the number of viewers places no additional incremental burden on the spectrum. Moreover, unlike many mobile services, each television station transmits over its entire spectrum allotment during all or virtually all of the day; there are not peaks and valleys in transmission during which spectrum is unutilized or underutilized.¹⁵

In contrast, most wireless telecommunications networks are designed with a large number of low-power transmitters, or cells, interwoven to create a coverage area for a

¹⁴ *Attachment B* includes a description of the Harris® MHP™ platform and associated Harris transmission and encoding equipment. For additional information on Harris’ complete line of Mobile DTV products visit: <http://www.broadcast.harris.com/productsandsolutions/TelevisionTransmission/MobileTelevisionSolutions>.

¹⁵ Statement Senator Gordon Smith, CEO and President, National Association of Broadcasters, Before the United States House of Representatives Committee on Energy and Commerce, Subcommittee on Communications, Technology and the Internet, Hearing on “Spectrum Inventory and Relocation” (Dec. 15, 2009).

city, region or country. Wireless telecommunications providers require a dedicated connection for each user in order to transmit a user's side of the conversation back to the tower. Unlike broadcasting, the more users on a wireless or wired telecommunications network, the greater the burden that is placed on that networks spectrum or capacity. Today data, in particular video, is placing an unprecedented burden on many telecommunications networks. According to comments previously filed in this proceeding by CTIA, "watching a YouTube video on a wireless device consumes almost on hundred times the data bandwidth of a voice conversation...."¹⁶

Clearly, as the demand and awareness of mobile content continues to grow, existing telecommunications systems will become overloaded and congested with traffic. CTIA has estimated that "wireless traffic volume is more than doubling each year"¹⁷ and according to Cisco, by 2013 "nearly 64 percent of the world's mobile traffic will be video."¹⁸ This dramatic growth of data services, especially video, will make current wireless telecommunications spectrum allocations insufficient to meet users anticipated network needs.¹⁹ Fortunately, broadcasters' Mobile DTV solution can offer telecommunications providers a reprieve from growing network congestion, capacity constraints, and spectrum scarcity concerns. Broadcasters' can utilize their licensed spectrum to address telecommunications providers' network issues by delivering real-time, rich, unidirectional media steams, leaving bidirectional interactivity to the mobile and wired telecommunications networks. This complementary approach allows mobile

¹⁶ Comments of CTIA, In the Matter of a National Broadband Plan For Our Future, Public Notice Number 6, GN Docket Nos. 09-47, 09-137, 09-51, p. 9 (filed Oct. 23, 2009).

¹⁷ Id., at 11.

¹⁸ Id.

¹⁹ Id., at 10-13.

users to obtain rich media content, while telecommunications providers are able to preserve significant spectrum, bandwidth, and network capacity.

C. The True Capability of Digital Broadcasting Is Just Starting To Be Realized.

Digital broadcasting is more than just “traditional broadcasting;” innovative offerings, such as Mobile DTV, will not only provide broadcasters with enhanced communication abilities—allowing them to more effectively relay information to their local community, such as emergency alerts and AMBER alerts—but will also provide citizens with increased access to local news, weather, traffic, and information of local importance. Digital broadcasting has provided broadcasters with the unique opportunity to expand the scope of their service and provide additional public interest benefits.

Utilizing their digital spectrum, broadcasters are developing a number of new and innovative service offerings, in addition to traditional broadcasting services, that will advance the public interest in novel ways. For example, in April 2009 the City of Raleigh, North Carolina, and digital television broadcast station WRAL launched a partnership that would use the Mobile DTV system to deliver real-time DTV and data services to screens on Capital Area Transit (“CAT”) buses.²⁰ By August 2010, 25 buses are slated to be equipped with three 22-inch LG flat screen monitors in each bus. Local or syndicated broadcast video content will be simultaneously displayed on each screen with a combination of local weather, news, real-time transit schedules, route specific updates, advertising, emergency alerts, or other public announcements. Teaming with LG Electronics to provide Raleigh and WRAL with technology for the service, Harris is providing the system with mobile transmission equipment, digital signage systems, and

²⁰ *Attachment C* provides articles discussing the Raleigh, North Carolina Mobile DTV bus project.

development and support services. WRAL's Mobile DTV service was successfully launched on three CAT buses in June 2009.

In addition to providing simultaneous video and data, broadcasters' digital spectrum also makes non real-time, file based delivery of content possible. Harris has been working closely with Sezmi Corporation to launch an end-to-end television service that provides access to a variety of programming content from broadcast, cable, and the Internet. Sezmi's utilization of both broadcast spectrum and broadband services "helps bring more households into the digital era by providing both traditional broadcast television and Internet video service in a usable form to those perhaps unable to afford typical subscription services or personal computers."²¹ Through Harris' Advanced Media Center, located at Harris corporate headquarters in Melbourne, Florida, Harris supports a broad range of workflow across Sezmi's network.²² Sezmi's integrated broadcast/broadband service is an example of the precise spectral efficiencies that broadcasting is capable of achieving by utilizing the capacity of the broadcast infrastructure to reach many, and using the limited bandwidth and capacity of broadband to reach out on a more individualized basis.²³

Data services and non real-time delivery is likely only the beginning of what broadcasters will be capable of providing with their existing spectrum allocations. There are numerous additional public benefits that will surely be revealed as Mobile DTV is rolled out. However, the country will only be able to realize these benefits if

²¹ Comments of Sezmi Corporation, In the Matter of a National Broadband Plan For Our Future, Public Notice Number 6, GN Docket Nos. 09-47, 09-137, 09-51, p. 3 (filed Nov. 13, 2009) ("Sezmi Reply NBP PN # 6").

²² *Attachment D* provides a description of how Sezmi Corporation utilizes Harris' Advanced Media Center.

²³ Sezmi Reply NBP PN #6, *supra* note 21, at 5.

broadcasters are provided the opportunity to launch Mobile DTV services, determine its potential, and work with manufacturers and other interested parties to develop additional capabilities.

V. Dynamic Channel Sharing of Licensed Broadcast Spectrum Would Be Permissible On A Non-Interfering, Licensed Basis.²⁴

Harris believes that dynamic channel sharing in spectrum that is not being used by licensed television services (frequently referred to as “white spaces”) would be a positive way to leverage existing broadcast spectrum allocations, while still providing broadcasters the ability to continue developing new and innovative broadcast solutions to serve the public interest. Such an approach could be particularly effective in providing fixed broadband access in rural markets where broadcast bands—and many non-broadcast bands—are used less intensely. However, the Commission must continue to ensure that any permitted use of TV white spaces is done with the proper technical safeguards and protects both existing and future broadcast operations. To further this end, Harris believes that a licensed framework would be the most effective way to minimize interference with broadcast operations, while maximizing and encouraging the use of TV white spaces.

Harris commends the Commission’s actions to date to find a way to utilize TV white spaces on a non-interfering basis.²⁵ However, the Commission can expand upon its current rules

²⁴ Question B.1 of the Commission’s Public Notice asks “what are the advantages of a channel-sharing approach to broadcasters’ business? What are the disadvantages of this approach? What are the technical and business requirements to enable successful channel sharing?” NBP Public Notice 26, *supra* note 1, at 3.

²⁵ See In the Matter of Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band, Second Report and Order and Memorandum Opinion and Order, EB Docket Nos. 04-186 and 02-380, 23 FCC Rcd. 16807 (rel. Nov. 14, 2009) (permitting unlicensed radio transmitters to operate in the broadcast television spectrum at locations where that spectrum is not being used by licensed services while implementing initial safeguards to prevent harmful interference to incumbent communications services).

to ensure that devices operating in TV white spaces do not interfere with broadcast operations.²⁶ Specifically, the Commission should permit the use of TV white spaces in rural areas on a non-exclusive, licensed basis.

A licensing regime will provide additional inference protection for broadcasters, while providing prospective white space users with minimal regulatory burdens and the ability to foster the introduction of new and advanced services to the American public. The addition of a licensing requirement will also maximize spectral efficiency, an inherent goal of providing access to TV white spaces, by ensuring more orderly operation within the band and providing for a more structured entry into the band. A non-exclusive licensing framework is aligned with the Commission's action in this proceeding by maintaining the desired balance between providing "flexibility and low barriers to entry needed to provide opportunity for everyone to make the best use of this under-used spectrum"²⁷ and "protect[ing] those that already make valuable use of the spectrum."²⁸

VI. Conclusion

Harris believes that leveraging broadcasting capabilities and infrastructure is vital to the success of the National Broadband Plan. By preserving current broadcast spectrum allocations the Commission has the opportunity to promote technological innovations within the broadcast industry and encourage broadcasters to be part of the country's broadband solution. Repacking or reallocating broadcasters' current spectrum allocations will stifle innovation and be a detriment to the public interest. Harris stands ready to

²⁶ "We find that the geo-location/database and spectrum sensing methods offer the most practical solutions for identifying unused TV channels and are therefore incorporating both of these methods into the rules for unlicensed TVBDs." *Id.*, at 16836, ¶ 72.

²⁷ *Id.*, at 16929.

²⁸ *Id.*

work with the Commission, the broadcast industry, and telecommunications providers to present innovative ideas that leverage broadcasters' existing infrastructure and enhance America's broadband capabilities.

Respectfully submitted,

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December 22, 2009

Attachment A



MOBILE TV TRANSMISSION



Mobile TV Solutions

Broadcast Mobile Solution

For the transmission of television or video content to mobile devices, the terms "mobile video" and "mobile TV" are often used interchangeably. However, typically one would use "mobile video" to define the delivery of video content via cellular systems, while "mobile TV" is used to describe specialized broadcast overlay networks that use technologies such as DVB-H, T-DMB, MPH™ and FLO™.

While streaming point-to-point approaches to mobile content delivery can be effective in developing consumer interest in mobile television — or in serving video-on-demand and more specialized content interests — purpose-built broadcast overlay networks will be the most economical approach to implementing high-quality, large-scale mobile television services.

Packet Cellular Video



- One-to-one, point-to-point
- Services: short video clips
- Global infrastructure cost per viewer: HIGH

Mobile Broadcast Television



- One-to-millions, point-to-multipoint
- Services: broadcast TV, video on demand
- Projected infrastructure cost per viewer: LOW

Currently, the leading technologies for mobile TV include:

- **DVB-H**, the mobile extension of the DVB-T terrestrial television standard.
- **T-DMB**, the mobile TV extension of the DAB digital audio broadcast system standard.
- **FLO™**, the system developed by Qualcomm.
- **MPH™**, the mobile TV system that is 100% compatible with the ATSC terrestrial television standard.
- **ISDB-T/ISDB-Tb**, the mobile extension of ISDB, the digital broadcasting approach developed in Japan.

DVB-H Mobile Solution

DVB-H is based on the DVB-T specification for digital terrestrial television, adding features designed to take into account the limited battery life and mobile reception required for handheld devices. DVB-H uses time-slicing, where bursts of data are received periodically, allowing the receiver to power off when it is inactive, which results in significant power savings. DVB-H employs forward error correction to further improve the mobile performance of DVB-T. DVB-H typically operates in the UHF Television band.



T-DMB Mobile Solution

Digital Multimedia Broadcasting (DMB) is based on the globally used digital audio broadcasting (DAB) core standard, which was originally designed for mobile receivers. This means that the conventional DAB transmission system can be used for DMB transmission by simply adding a DMB video encoder to the existing DAB system.



Since DMB and DAB are delivered on the same system, DMB devices can receive not only DMB multimedia services, but also DAB audio services. T-DMB operates in the VHF Band III and L Band.

Media FLO™ Mobile Solution

Developed by Qualcomm, FLO™ (forward link only) technology is a multicast innovation designed to increase capacity for content delivery to mobile handsets. FLO™ better enables the simultaneous wireless delivery of multimedia (high-quality video and audio) to a large number of users.



There likely will be multiple spectrum bands used, depending on the region. The frequency bands suitable for multicast distribution (including FLO technology) are similar to those used for unicast

MPH In-Band Mobile DTV Solution

wireless IP and voice. R/O typically operates in the UHF Television band.



MPH™ In-Band Mobile DTV Solution

MPH™ is an in-Band mobile service utilizing the broadcaster's ATSC digital transmission system and a portion of the transport stream. The MPH™ (Mobile-Pedestrian-Handheld) system processes the mobile channels with additional forward error correction and data redundancy, while using a more robust modulation waveform to help ensure successful reception.

Unlike some proposed in-band ATSC systems, MPH™ is completely compatible with standard ATSC receivers and all elements of the ATSC standard, causing no issues with the PSIP program guide and distributed transmission capability. MPH™ is significantly more bit-efficient than competing systems.

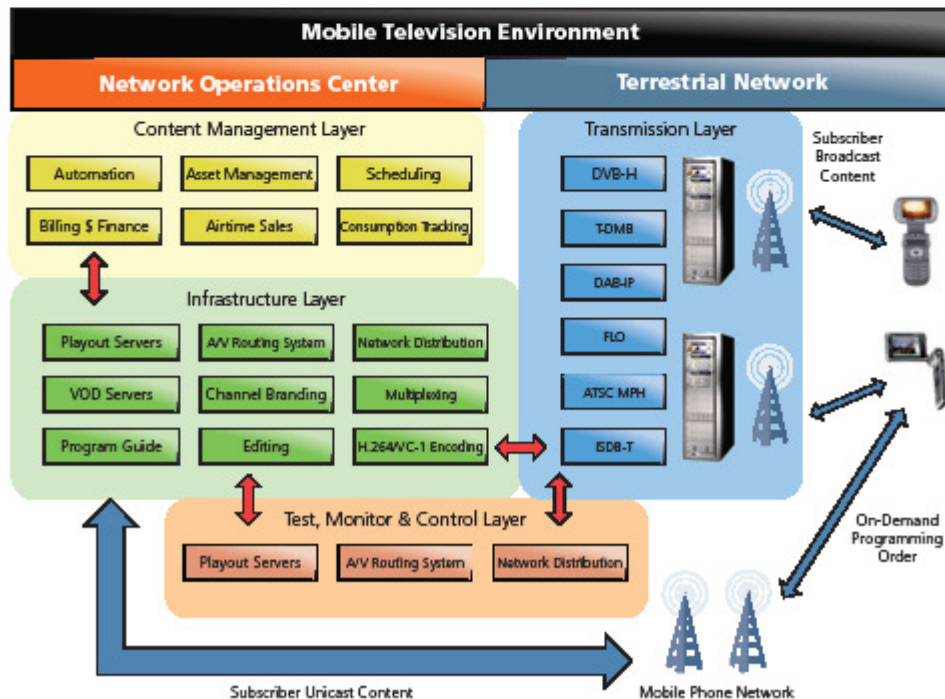
The MPH™ signal is encoded and modulated differently, but it is

multiplexed with the ATSC programming in a way that does not interfere with the home receiver. In this way, the MPH™ component acts no differently than a datacasting service that is broadcast by an ATSC transmitter — it can only be detected and decoded by an MPH™-compatible receiver.

ISDB-T/ISDB-Tb Solution

Developed in Japan, ISDB (Integrated Services Digital Broadcasting) is a digital broadcasting standard that supports three kinds of systems — ISDB-S (Satellite), ISDB-T (Terrestrial) and ISDB-C (Cable) — enabling commonality for multimedia broadcasting services using each network.

Based on the results of field trials, ISDB-T was adopted in Japan as the digital terrestrial television broadcasting (DTTB) system and digital terrestrial sound broadcasting (DTSB) system in 1999. Brazil adopted ISDB-Tb as its digital terrestrial TV standard in 2006.



Comprehensive — Interoperable — Scalable

One Company. One Direction. The Future.

Harris is the ONE company delivering interoperable workflow solutions across the entire mobile content delivery chain.

The Harris mobile TV offering is the only solution in the broadcasting and communications industries that spans four key layers of a mobile TV architecture:

Content Management, Infrastructure, Transmission and Test, Monitoring and Control.

Harris is the only vendor capable of delivering a solution with this breadth and scale. The company's mobile TV offering enables service providers to create and deliver complex cross-delivery advertising campaigns, programming playout and other network-based services across a seamless transmission network.

The Harris Mobile TV offering delivers:

Reliability and efficiency. Harris software and systems work together under common business rules throughout the architecture.

Scalability. Harris' interoperable systems allow mobile TV systems to be built small or large, or grow over time with more channels and services.

Revenue optimization. With Harris' industry-leading content management and media business systems, providers can optimize advertising revenue across multichannel or multiservice (television and video-on-demand; standard or high definition) environments.

Content optimization. With Harris' industry-leading infrastructure systems, providers can manage and repurpose content from a common storage platform — from news to production to air.

Versatility. Harris solutions deliver complete digital content workflow processes in compressed or uncompressed domains at the national, regional or local headend offices. Only Harris offers solutions for all the global mobile TV standards including DVB-H, T-DMB/DAB, Media FLO™, ISDB-T/ISDB-Tb and ATSC MPH.

Harris has the proven technical capabilities you need to deliver content to mobile devices. From content management to infrastructure to transmission and monitoring and control, Harris offers proven workflows for mobile TV. They add up to an interoperable, intelligent and cost-effective mobile TV system for your operation.

Transmission Systems offers television and radio's most complete range of products and integrated systems, including Harris' industry-leading analog, digital and mobile transmitters and PR&E audio and networking consoles, reducing the cost of conversion to digital transmission and enabling new revenue streams. This business area stretches from single products to end-to-end systems, including networks with hundreds of transmitters.



Software Systems is a leading provider of software solutions for advertising, media management (traffic, billing and scheduling), broadband, digital asset management and automation for workflow management. The Software Systems area offers modular, standards-based solutions with open APIs for maximum ease of integration and future scalability.



Networking & Infrastructure Solutions is an industry leader in high-performance, multiformat solutions for professional digital video and highly differentiated network access and multiplex platforms. Harris offers an award-winning portfolio of









processors, routers, master control and branding systems, network monitoring and control software, and test and measurement instruments.

Digital Media Systems offers a comprehensive portfolio of servers, graphics and editing solutions, digital signage and branding solutions that increase operational efficiencies and offer new revenue opportunities.



Mobile TV Solutions

Harris Transmission for Mobile TV

	VHF	UHF	L Band
DVB-H		 <p>VHF Liquid Cooled 1.5 to 9 kW Atlas Air Cooled 10 W to 2.9 W</p>	 <p>Cool Play Air cooled outdoor based platform 10 to 400 watts</p>
ISDB-T/ ISDB-Tb		 <p>Atlas Liquid Cooled 1.5 to 18 kW</p>	
DAB/T -DMB	 <p>DAB 670 Air cooled modular platform 40 to 6000 watts</p>		 <p>DAB 665 Air cooled modular platform 10 to 800 watts</p>
FLO		 <p>Atlas Liquid Cooled 1.5 to 9 kW Ranger Air Cooled 100 to 1000 W</p>	
ATSC MPH	 <p>Platinum-/ Air cooled platform 1.8 to 16 kW</p>	 <p>Ranger - Air 100 to 1000 W Diamond - Air 1.8 to 34.5 kW Power CD - Liquid 30 to 90 kW</p>	

ONE Company for Workflow Solutions Throughout the Broadcast Chain

Harris is the ONE company delivering interoperable workflow solutions across the entire broadcast delivery chain — providing today's broadcaster with a single, integrated approach to capitalize on the benefits of IT and mobile applications. By providing unparalleled interoperability across our product portfolio, Harris is able to offer customers integrated solutions that improve workflows, save money, enable new revenue streams and provide a migration path to emerging media business models. To meet the evolving needs of broadcast, distribution, government agencies and entertainment businesses, Harris is the ONE answer for change.

Service And Support

At Harris, we are committed to customer service excellence. It is our goal to provide the highest level of support by applying a simple rule: We take ownership of helping our customers succeed. Our support teams consist of innovative technical experts who support all situations regarding product performance, integration and operational processing. We are adept at providing proven solutions, making workflows better and ensuring reliability of the product and system. At Harris, our experienced and dedicated teams stand ready to help you meet your goals for premium product performance, 100% up-time and reduced maintenance investment.

Warranty

Because we want to assure you that Harris stands beside its products and system solutions, our products carry a standard set of warranty services, which are competitive with — and in some cases outperform — others in the industry.

Service Packages

We offer value-add services that allow you to customize the level of services you need in meeting mission-critical performance levels. Our service package options offer many ways to upgrade your standard warranty by choosing the All-Inclusive OnePak, or by selecting individual services from our extensive portfolio. Our service and support advisors can assist in the selection of the individual services that best suit your requirements.

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Asia, Pacific Rim	+852 2776 0628

For more information please visit www.broadcast.harris.com.

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Attachment B

MPH

ATSC Mobile DTV

For the past three years, Harris has been deeply involved in mobile TV on-air testing and field trials. This extensive hands-on experience uniquely positions Harris as experts in ATSC Mobile DTV technology. As a major supplier in digital TV transmission and mobile TV, Harris Corporation leads the way in developing an advanced, feature-rich, ready-to-deploy solution for ATSC Mobile DTV.

What is ATSC Mobile DTV?

ATSC Mobile DTV emerged from an intense development effort by participants from across the global television and mobile device industries. This landmark technology will enable broadcast television delivery of digital television transmissions to mobile and handheld devices — and provide broadcasters with a means to address a new market that was previously out of reach.



The ATSC Mobile DTV system allows the simultaneous transmission of standard ATSC terrestrial and robust mobile-handheld services over the same infrastructure.

MPH™ — The Harris Solution for ATSC Mobile DTV Broadcast

The Harris ATSC Mobile DTV platform provides the broadcast equipment that ATSC broadcasters need to immediately begin transmission of ATSC Mobile DTV services.

The following equipment list assumes the use of existing ATSC encoding, multiplexing, PSIP and transmitter.



MPH Encoder – HALRENC-A21-MBL

This [NetVX™](#) encoding module is used to compress a single audio and video stream into the transmission format needed for ATSC Mobile DTV.

Synchrony MNA™ Distributed Transmission Studio Adapter

The Synchrony MNA™ adapter is a multifunction platform that will support preprocessing of the M/H data, multiplexing of the processed M/H data into the ATSC transport stream, generation of FIC/TPC signals, generation of ATSC system time and synchronization/timing adjustment of the ATSC transport for distributed transmission networking.

Apex M2X™ Multimedia Exciter with ATSC Mobile DTV Postprocessor

The [Apex M2X™](#) exciter supports the processing and modulation of standard ATSC A/53 signals and can easily be upgraded for both ATSC A/110 distributed transmission service and ATSC A/153 mobile DTV service.

Mobile Signaling Generator, Basic Electronic Service Guide (ESG) and Advanced Electronic Service Guide Server Platform - RBXRB100021

The RBXRB100021 solution from Roundbox is a software-based modular platform that runs on a server platform and provides scalable services to support ATSC mobile DTV operations.

CONTACTS

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Attachment C

Raleigh Puts Mobile DTV on Buses

Transit users in the Research Triangle area of North Carolina have a new way to stay informed during their commute.

The City of Raleigh and WRAL announced on April 13 the first public deployment of mobile DTV in a Capital Area Transit (CAT) bus.

"We are proud to be the pilot to offer mobile digital television to the riders of the Downtown Circulator," stated Raleigh Mayor Charles Meeker. "We salute WRAL for being pioneers in mobile digital television as they were in high definition television. We look forward to the day when all of Raleigh's CAT buses will offer this means of information and relaxation."

The service uses the ATSC-M/H mobile DTV system to deliver real-time DTV and data services to screens on CAT buses. The initial installation is on a single CAT R-Line Downtown Circulator bus, but four more buses are slated to be fitted with the system for the pilot period, which runs through August 2009. An additional 20 CAT buses will be equipped with

mobile DTV during the second phase of the project, which runs September 2009 through August 2010.

The on-bus screens will carry local and syndicated programming from WRAL, along with a Doppler radar image, city news, real-time transit schedules, route-specific updates,



Capitol Broadcasting CEO Jim Goodman (L) and Raleigh Mayor Charles Meeker check out WRAL's mobile TV service.

advertising and other information.

"Mobile DTV broadcasting enables WRAL to better serve our viewers, communities and advertisers by providing a strong combination of anywhere access, two-way communication and mobility," stated

James F. Goodman, president and CEO of Capitol Broadcasting Co. Inc., owner of WRAL.

The technology driving the system is being provided by Harris Corp. and LG Electronics. Harris is providing mobile transmission equipment, the digital signage systems and development and support services, while LG is delivering mobile DTV receivers, flat-screen monitors and project development and support.

According to Harris, WRAL will send a mobile DTV signal of its live channel multiplexed with its ATSC transport stream from a 1 MW Harris transmitter using the Harris MPH platform for reception by LG receivers on the buses.

On the buses, Harris InfoCaster digital signage systems will distribute the content to three LG flat-screen monitors in each bus. The live WRAL mobile DTV signal will be displayed along with weather graphics, advertising, public announcements, text messages and other information.

US-based Capitol Broadcasting Company, Inc. (CBC) owns and/or operates a range of media organisations in North Carolina. One of its five television stations, WRAL-TV in Raleigh, recently launched the first publicly available, free, over-the-air broadcast of mobile DTV in the US. WRAL-TV's **Steve Hammel**, vice president and general manager, and **Pete Sockett**, chief engineer, report.

Mobile DTV hits the streets

At WRAL-TV, our commitment to providing our community with the highest quality media service - along with our commitment to digital television - forms the basis of our everyday business practices and decisions. Being 'first' is part of what we do, and we're proud to be recognised across the broadcast industry as a national pioneer in television and media technology.

In 1996, WRAL became the first commercial station in the US to broadcast a high-definition signal. In 2000, WRAL became the first station in the world to broadcast an all-HD newscast. And in spring of 2009, WRAL launched the nation's first free, over-the-air broadcast of mobile DTV to the public.

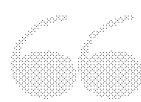
Taking mobile DTV to the streets

The idea for our mobile DTV deployment began to take root in July 2008, when we worked with Harris Corporation and LG Electronics - co-developers of the technology underlying the Advanced Television

Systems Committee's emerging ATSC Mobile DTV Standard - on a week-long demonstration at WRAL. Rather than simply providing a demo for our staff, WRAL hosted an event for members of the community, advertisers, retailers and city officials to show them what the future of broadcasting would look like. We felt it was important for us to share the possibilities and get feedback from our community.

Through this event, a conversation began with the leaders of the city who recognised that mobile DTV could provide an innovative new service. They had been looking for ways to improve the rider experience on city buses - and this seemed like the right idea at the right time.

In a joint effort of WRAL, the CBC New Media Group and the City of Raleigh, the first public deployment of broadcast mobile DTV in the US would deliver live WRAL-TV broadcasts to Capital Area Transit (CAT) buses traveling around North Carolina's capital city. The plan was to implement innovative broadcast technology that would increase our audience and reach and also bring significant benefit to the community, to the city and to local business owners.



For WRAL, this mobile DTV initiative provides a unique, new way to increase our audience reach, brand awareness and advertising sales.



Simultaneous upgrade to digital and mobile TV

Planning the actual technology implementation for our mobile DTV initiative was surprisingly painless. We love the solution because it allows us to deliver multiple high-definition channels - along with mobile television - with a single signal. For this project we simply installed a Harris mobile DTV exciter and signal encoding equipment on our existing TV transmission systems and gained the ability to transmit a robust, digital mobile TV signal at very little cost.

We are using this system to split our 19.4 Mb/s of capacity into a slice for HDTV, a slice for SDTV - both for delivery to DTV receivers in the home - and now a slice that can be received on mobile DTV-capable devices such as mobile phones, laptop and netbook computers and in-car receivers.

Much of the upgrade we made for the mobile DTV deployment involved steps we would have taken anyway in preparation for the mandated US DTV transition. We had to move from channel 53 to channel 48, and this move included an upgrade of our existing antenna and transmitter

Continued on Page 56.



system. We installed a new, omnidirectional antenna and increased the vertical polarity (which is critical for mobile DTV) from 15% to 40%. We also implemented an all-new RF system on the ground to accommodate the new frequency and re-tuned our transmitter to the new frequency.

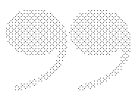
Mobile DTV workflow - from facility to fleet

Having worked with Harris on many of our technological 'firsts', we were pleased that the company had developed the first deployment-ready, end-to-end platform for ATSC mobile DTV. The Harris MPH platform provides all the hardware and software components that broadcasters need to implement mobile DTV services: the NoViX mobile encoding platform, Synchrony WNA synchronous mobile and networking adapter, Apex MZX exciter and the Roundbox Signaling and ESG Server. In a matter of hours, our mobile DTV system was installed and up and running.

The plan was to use the MPH system to simulcast WRAL's live channel multiplexed with its ATSC transport stream from our 1-megawatt Harris transmitter. LG mobile DTV receivers installed on a fleet of 20 Raleigh city buses serving different routes would receive the signal and present it to passengers as part of a digital signage solution.

On the buses, Harris InfoCaster digital signage systems would send the content to two LG flat-screen monitors. In addition to live WRAL mobile DTV, InfoCaster would also display other WRAL content such as Doppler weather radar, current and forecast conditions, a news ticker, public announcements and advertising. These elements would be updated in real time using a cellular data network.

66
In the US today, there are only 114 million television households, but there are nearly 300 million mobile devices sold each year. While this represents a significant opportunity, most receiver manufacturers and sales channels will want the assurances of broadcasters that service will be available before they commit to ordering, building and stocking receivers.



Did it work?

During our inaugural run in April, city leaders, local and national media, and members of our Chamber of Commerce and Downtown Alliance were invited to ride the first, specially fitted bus. The feedback was overwhelmingly positive, particularly on the overall layout and design of what passengers saw on screen - mobile broadcast DTV programming combined with weather and news in a user-friendly format.

Nearly everything went as planned during our April launch, and this phase of our mobile DTV implementation was extremely successful. A primary concern we had early on in the trial was how consistent the mobile reception would be - but it was rock-solid. Two more phases are planned before the end of the year, during which more buses will be added to the system.

Overall, most of the obstacles we experienced during the pilot phase involved having gear uniquely designed to handle the transit environment. For example, power issues that are unique to being on a bus are being addressed for the next round. Also, as the City of Raleigh uses state-of-the-art, hybrid buses complete with built-in rack space for the on-board equipment, Harris is making some form factor modifications so the equipment will best fit these on-board racks. They are also 'ruggedising' the InfoCaster system to handle the rigors of the transit environment. Finally, we tried two different size monitors in the pilot phase, and we have decided to only use the smaller 22-inch monitors in future phases due to vibration.

Win-win business model

Once fully implemented, this groundbreaking mobile DTV and digital signage deployment will enable the City of Raleigh to provide a unique service and valuable information to city transit passengers. The mobile DTV deployment allows the city to immediately improve the rider experience and develop a new revenue stream that can be invested into long-term improvements of the transportation system - without having to raise taxes.

In addition to providing passengers with news, weather, entertainment and local information, the mobile DTV initiative will ultimately provide a

medium for hyper-local advertising via the digital signage system, which will promote restaurants, stores, shows and events along each bus route. Interactive ads - where passengers instantly respond by sending texts from their cell phones - are already being offered by CBC New Media Group.

Once the mobile DTV deployment is fully integrated into the transit system, it will be possible to distribute targeted ads at specific times of day, tailored to the demographic of the rider. For example, on Saturday night at 10pm, when 20-somethings are riding around town, businesses can advertise a band that is playing at a club at the next stop.

For WRAL, this mobile DTV initiative provides a unique, new way to increase our audience reach, brand awareness and advertising sales. This early deployment also goes beyond simply entertaining and informing passengers - it also provides a great platform to raise public awareness about the availability of mobile DTV.

The future of mobile DTV

In the US today, there are only 114 million television households, but there are nearly 300 million mobile devices sold each year. While this represents a significant opportunity, most receiver manufacturers and sales channels will want the assurances of broadcasters that service will be available before they commit to ordering, building and stocking receivers.

Since our initial launch, more than a dozen other markets have reached out to us - broadcasters and transit companies alike - asking how they can replicate what we've done in Raleigh. Although the widespread implementation of mobile DTV may still be years out when it comes to consumer devices, WRAL is proving that transit represents a viable market for mobile DTV today.



Attachment D

AD
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How Harris supports the first all-in-one personalised television system

Advanced Media Center for Sezmi

360 Infrastructure

By Ian Collis, Director of
Product Marketing,
Harris Broadcast
Communications EMEA

With the channel explosion occurring worldwide — HD, SD, mobile, IPTV, streaming media, nonlinear, digital signage and out-of-home advertising — today's broadcasters are presented with significant challenges including how to support the creation of new channels and how to monetise and streamline the traffic and scheduling of those additional channels. In the transitioning market, 'advanced media workflow' has become more than just an industry buzzword: it's become a foundation for companies looking to fully embrace new business models.

One real-world example of a company leveraging the business opportunities presented by an advanced media workflow is Sezmi Corporation — the developers of the first, all-in-one personalised television system. Formed in 2006 with the goal of developing and introducing the first true alternative to expensive cable and satellite services, Sezmi is redefining how content is delivered and consumed in the home. The company's planned commercial offering combines traditional TV content with local and cable stations, movies, past episodes, Internet videos, and more — all on-demand — in a way that allows personalised viewing options at an affordable price.

The Sezmi network delivers programming through a combination of over-the-air broadcasting and wired broadband to the home, using a hybrid delivery mechanism that Sezmi brand as FlexCast. FlexCast technology combines the efficiency and scale of terrestrial digital broadcast delivery with the interactivity and access of existing broadband infrastructure.



Sezmi is using a combination of technology at the Advanced Media Center that includes D-Series automation and Vision scheduling software

To support content delivery across its national network, Sezmi turned to Harris Corporation, which operates a network operations center from its headquarters in Melbourne, Florida. The Harris Advanced Media Center supports a broad range of workflows that manage the flow of Sezmi's linear and file-based programming through the local TV stations and broadband service providers. By leveraging the Harris facility's advanced media workflow, Sezmi is able to ingest, manage and deliver its personalised viewing experience for subscribers across the United States.

Automation inside the
Advanced Media Center

Supporting Sezmi's business model of delivering a truly personalised experience to each household member requires a broader range of control, visibility and automation than is typical of a traditional video headend, as well as a higher degree of integration and metadata utilisation than is typical of most multichannel delivery systems. To achieve this advanced media workflow, Sezmi is using a combination of technology at the Advanced Media Center that includes D-Series automation and Vision scheduling software.

The Vision program management system combines planning,

rights management and scheduling within one workflow-based solution. All programming elements of the multichannel operation are managed by the scheduling engine, which creates and manages a unified, single-frame-accurate playlist, combining programming content, interstitials, commercials and promotions. Vision automates many of the reporting processes such as genre segmentation, regional programming and special needs, while generating auditable reports for music and program rights usages after each channel is played out.

In a typical linear programme channel application, the Vision programme management system passes both incoming and outgoing program schedule information in real-time to the D-Series automation system via the SMPTE Broadcast eXchange Format (BXF) protocol. The D-Series system then manages the processing of the incoming linear channels, from satellite receiver assignment to routing, decoding, incoming QA, signal processing, graphics and branding integration and time-shifting operations. Because the system supports open metadata exchange standards BXF, MXF, AAF and V-ISAN, D-Series DSX is ideal for the types of advanced media

workflows necessary to support the Sezmi network.

At the Advanced Media Center, the D-Series system provides dual redundancy, with computers that continuously shadow the main computer so that they can take over instantly if necessary, without any effect on the running schedules. While D-Series supports fully hands-off operation, operators can also readily take control during live events. When processed and stored files are ready for playback, the Harris Center relies upon the close integration of the Nexio AMP media platform, Vision programme management and the D-Series automation system to get the right files to the right customers at the right time and in the right formats.

It is critical that Sezmi can effectively schedule, manage and confirm successful delivery of content to the subscriber. The Advanced Media Center enables personalised content distribution through a sophisticated set of tools that include Invenio Motion a media transport system. Invenio Motion allows automated workflows to be choreographed for nearly all file-based operations, including digital media ingest, transcoding, media duplication or transport, automated transfers and management of associated tasks like QC or closed-caption extraction.

The Harris Center provides efficient ways of monitoring the flow of all content going into and out of the hub. Most elements of the content flow are monitored through the Harris CCS Navigator system, which provides a standardised, unified control system over the center's routers, signal processing equipment, branding systems, servers and test and measurement equipment. The Harris facility currently features three operator control stations — each featuring five display screens — which enable

Continued on page 22

professionals." Barco's RHEW-2300P is specifically targeted applications like on-set and dailies viewing, film scanning and restoration, various digital intermediate processes such as colour grading, visual effects, computer generated images and digital film mastering, as well as post production of trailers, commercials and music. www.barco.com

trailers, and main titles for 2007's horror film, *Miraculor (Hauriad)*.

Advanced Media Center for Sezmi

Continued from page 34

operational control and visibility over all the programme channels flowing through the Center.

Just a year later, I had stepped up to the newest DeckLink HD

Overall visual network oversight is provided through a wall-sized display driven by the Harris Centrio multiviewer. Integrated within the Platinum router, Centrio provides access to all audio and video channels flowing through the Center, while its large-screen display makes it easy to observe and

exactly the quality I needed to evaluate my own work and also

analyse alarm conditions and respond to system events.

Sezmi offers a true alternative to cable and satellite — enabling broadcasters to realise immediate new subscriber revenue, achieve targeted advertising, gather rich individual viewer data, and create branded zones that integrate linear TV and online content.

Cam Gil is a designer, director and animator. www.camgil.com

"Sezmi offer broadcasters a host of compelling new opportunities," says Bruno Pati, Sezmi's CEO. "As television viewership changes, broadcasters are urgently looking for a way to adapt their business models to take advantage of new revenue possibilities. Sezmi offers them a solution for these problems."